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EXAMINER	
ZERVIGON, RUDY	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/822,358	SHAJII ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 21-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 21-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 19, 2008 has been entered.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-8, and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashley; Ethan (US 5,565,038 A) in view of Nawata, Tokuhide et al. (US 20040244837 A1). Ashley teaches a system (Figure 1; column 8, lines 1-65) for delivering a desired mass of gas (1; Figure 1), comprising: a chamber (7; Figure 1; column 8, lines 17-27); a first valve (4; Figure 1; column 8, lines 1-16) controlling gas (1; Figure 1) flow into the chamber (7; Figure 1; column 8, lines 17-27); a second valve (13/14; Figure 1; column 8, lines 1-16) controlling gas (1; Figure 1) flow out of the chamber (7; Figure 1; column 8, lines 17-27); a pressure transducer ("PS8"; Figure 1; column 8, lines 17-27) providing measurements of pressure within the chamber (7; Figure 1; column 8, lines 17-27); a controller (20; Figure 1; column 8, lines 17-67) connected to the valves and the pressure transducer ("PS8"; Figure 1; column 8, lines 17-27) wherein the controller (20; Figure 1; column 8, lines 17-67) is configured and arranged to, receive a desired

mass flow setpoint (column 9; lines 1-20) from an input device (20; Figure 1; column 8, lines 17-67 = compare to applicant's specification [0031]), close the second valve (13/14; Figure 1; column 8, lines 1-16); open the first valve (4; Figure 1; column 8, lines 1-16); receive chamber (7; Figure 1; column 8, lines 17-27) pressure measurements from the pressure transducer ("PS8"; Figure 1; column 8, lines 17-27); close the first valve (4; Figure 1; column 8, lines 1-16) when pressure within the chamber (7; Figure 1; column 8, lines 17-27) reaches a predetermined level; wait a predetermined waiting period to allow the gas (1; Figure 1) inside the chamber (7; Figure 1; column 8, lines 17-27) to approach a state of equilibrium; open the second valve (13/14; Figure 1; column 8, lines 1-16) at time=t_0; calculate a value of the total mass delivered as the second valve (13/14; Figure 1; column 8, lines 1-16) is open and as a funtion of a temperature and pressure within the chamber (7; Figure 1; column 8, lines 17-27); and close the second valve (13/14; Figure 1; column 8, lines 1-16) at time=t* when the calculated value of total mass delivered equals the desired mass flow setpoint (column 9; lines 1-20) – claim 1

Ashley further teaches:

i. A system (Figure 1; column 8, lines 1-65) according to claim 1, wherein the mass delivered .DELTA.m at time t* is equal to, .DELTA.m=m(t_0)-m(t*)=V/R[(P(t_0)/T(t_0))-(P(t*)/T(- t*))] (5) wherein m(t_0) is the mass of the gas (1; Figure 1) in the delivery chamber (7; Figure 1; column 8, lines 17-27) at time=t_0, when the gas inside the chamber is at a state of equilibrium, m(t*) is the mass of the gas (1; Figure 1) in the chamber (7; Figure 1; column 8, lines 17-27) at time=t*, V is the volume of the chamber (7; Figure 1; column 8, lines 17-27), R is equal to the ideal gas (1; Figure 1) constant (8.3145 J/mol K), P(t_0) is the pressure in the chamber (7; Figure 1; column 8, lines 17-27) at time=t_0,

P(t*) is the pressure in the chamber (7; Figure 1; column 8, lines 17-27) at time=t*, $T(t_0)$ is the temperature in the chamber (7; Figure 1; column 8, lines 17-27) at time=t_0, T(t*) is the temperature in the chamber (7; Figure 1; column 8, lines 17-27) at time=t*, as claimed by claim 2

ii. A system (Figure 1; column 8, lines 1-65) according to claim 2, further comprising a temperature probe ("TS9"; Figure 1; column 8, lines 17-27) secured to the delivery chamber (7; Figure 1; column 8, lines 17-27) and connected to the controller (20; Figure 1; column 8, lines 17-67), wherein the temperature probe ("TS9"; Figure 1; column 8, lines 17-27) directly provides $T(t_0)$ and T(t*) to the controller (20; Figure 1; column 8, lines 17-67), as claimed by claim 3

iii. A system (Figure 1; column 8, lines 1-65) according to claim 3, wherein the chamber includes a chamber wall, and wherein $T(t_0)$ and T(t*) are calculated by the controller (20; Figure 1; column 8, lines 17-67) using: dT/dt=(.rho..sub.STP/.rho.V)Q.sub.out(.gamma.-1)T+(Nu.kappa./l)(A.sub.w/V-C.sub.v.rho.) .sub.w-T) (3) where .rho..sub.STP is the gas (1; Figure 1) density under standard temperature and pressure (STP) conditions, .rho. equals the density of the gas (1; Figure 1), V is the volume of the chamber (7; Figure 1; column 8, lines 17-27), Q.sub.out is the gas (1; Figure 1) flow out of the delivery chamber (7; Figure 1; column 8, lines 17-27), T equals absolute temperature, .gamma. is the ratio of specific heats, Nu is Nusslets number, .kappa. is the thermal conductivity of the gas (1; Figure 1), C.sub.v is the specific heat of the gas (1; Figure 1) under constant volume, l is the characteristic length of the delivery chamber (7; Figure 1; column 8, lines 17-27), and T.sub.w is the temperature of the wall of the chamber (7; Figure 1; column 8,

lines 17-27) as provided by the temperature probe ("TS9"; Figure 1; column 8, lines 17-27), as claimed by claim 4

iv. A system (Figure 1; column 8, lines 1-65) according to claim 4, wherein the gas (1; Figure 1) flow out of the chamber (7; Figure 1; column 8, lines 17-27) is calculated using: Q.sub.out=-(V/.rho..sub.STP)[(1/RT)(d.rho./d- t)-(P/RT.sup.2)(dT/dt)] (4), as claimed by claim 5

v. A system (Figure 1; column 8, lines 1-65) according to claim 1, wherein the value of the predetermined level of pressure is provided through the input device (20; Figure 1; column 8, lines 17-67 = compare to applicant's specification [0031]), as claimed by claim 6

vi. A system (Figure 1; column 8, lines 1-65) according to claim 1, wherein the value of the predetermined waiting period is provided through the input device (20; Figure 1; column 8, lines 17-67 = compare to applicant's specification [0031]), as claimed by claim 7

vii. A system (Figure 1; column 8, lines 1-65) according to claim 1, further comprising an output device (20; Figure 1; column 8, lines 17-67 = compare to applicant's specification [0031]) connected to the controller (20; Figure 1; column 8, lines 17-67) and wherein the controller (20; Figure 1; column 8, lines 17-67) is configured and arranged so as to provide to the output device (20; Figure 1; column 8, lines 17-67 = compare to applicant's specification [0031]) an indication of the mass delivered, as claimed by claim 8

viii. A system (Figure 1; column 8, lines 1-65) for delivering a desired quantity of mass of gas (1; Figure 1), comprising: a chamber (7; Figure 1; column 8, lines 17-27) including an

inlet (inlet to chamber 7; Figure 1; column 8, lines 17-27) and outlet (outlet from chamber 7; Figure 1; column 8, lines 17-27); an inlet valve (4; Figure 1; column 8, lines 1-16), connected to the inlet (inlet to chamber 7; Figure 1; column 8, lines 17-27), configured and arranged so as to control the flow of gas (1; Figure 1) into the chamber (7; Figure 1; column 8, lines 17-27) through the inlet (inlet to chamber 7; Figure 1; column 8, lines 17-27); an outlet valve (13/14; Figure 1; column 8, lines 1-16), connected to the outlet (outlet from chamber 7; Figure 1; column 8, lines 17-27), configured and arranged so as to control the flow of gas (1; Figure 1) from the chamber (7; Figure 1; column 8, lines 17-27) through the outlet (outlet from chamber 7; Figure 1; column 8, lines 17-27); and a controller (20; Figure 1; column 8, lines 17-67) configured and arranged to control the inlet and outlet valves so that (a) gas (1; Figure 1) can flow into the chamber (7; Figure 1; column 8, lines 17-27) until the pressure (as measured from PS8; Figure 1) within the chamber (7; Figure 1; column 8, lines 17-27) reaches a predetermined level, b) the pressure (as measured from PS8; Figure 1) of gas (1; Figure 1) within the chamber (7; Figure 1; column 8, lines 17-27) can reach a state of equilibrilum, and c) a controlled amount of mass of the gas (1; Figure 1) can then be measured and allowed to flow from the chamber (7; Figure 1; column 8, lines 17-27) as a function of a setpoint (column 9; lines 1-20) corresponding to a desired mass (*mass* flow controller; 4; Figure 1), and the temperature (as measured from TS9; Figure 1) and pressure (as measured from PS8; Figure 1) in the chamber (7; Figure 1; column 8, lines 17-27), as claimed by claim 21

ix. A system (Figure 1; column 8, lines 1-65) according to claim 21, further including a pressure sensor ("PS8"; Figure 1; column 8, lines 17-27) constructed and arranged so as

to provide a pressure (as measured from PS8; Figure 1) measurement signal (via 20) to the controller (20; Figure 1; column 8, lines 17-67) as a function of the pressure (as measured from PS8; Figure 1) within the chamber (7; Figure 1; column 8, lines 17-27), and a temperature sensor ("TS9"; Figure 1; column 8, lines 17-27) constructed and arranged so as to provide a temperature (as measured from TS9; Figure 1) measurement signal (via 20) to the controller (20; Figure 1; column 8, lines 17-67) as a function of the temperature (as measured from TS9; Figure 1) within the chamber (7; Figure 1; column 8, lines 17-27), as claimed by claim 22

x. A system (Figure 1; column 8, lines 1-65) according to claim 21, wherein the amount of mass of gas (1; Figure 1) flowing from the chamber (7; Figure 1; column 8, lines 17-27), delta m at time t*, is determined by the controller (20; Figure 1; column 8, lines 17-67) as follows: {}, wherein m(t*) is the mass of the gas (1; Figure 1) in the chamber (7; Figure 1; column 8, lines 17-27) at time = to when the gas (1; Figure 1) within the chamber (7; Figure 1; column 8, lines 17-27) is at a state of equillibrium, m(t*) is the mass of the gas (1; Figure 1) in the chamber (7; Figure 1; column 8, lines 17-27) at time = t*, V is the volume of the chamber (7; Figure 1; column 8, lines 17-27), R is equal to the ideal gas (1; Figure 1) constant, P(to) is the pressure (as measured from PS8; Figure 1) in the chamber (7; Figure 1; column 8, lines 17-27) at time = to, P(t*) is the pressure (as measured from PS8; Figure 1) in the chamber (7; Figure 1; column 8, lines 17-27) at time = t*, T(to) is the temperature (as measured from TS9; Figure 1) in the chamber (7; Figure 1; column 8, lines 17-27) at time = to, T(t*) is the temperature (as measured from TS9; Figure 1) in the chamber (7; Figure 1; column 8, lines 17-27) at time t*, as claimed by claim 23

xi. A system (Figure 1; column 8, lines 1-65) according to claim 21, wherein the controller (20; Figure 1; column 8, lines 17-67) is further configured and arranged to control operation of the inlet valve (4; Figure 1; column 8, lines 1-16) by control commands (column 9), as claimed by claim 24

xii. A system (Figure 1; column 8, lines 1-65) according to claim 21, wherein the chamber (7; Figure 1; column 8, lines 17-27) includes a chamber (7; Figure 1; column 8, lines 17-27) wall, and further comprising a temperature sensor ("TS9"; Figure 1; column 8, lines 17-27) configured and arranged to sense a temperature (as measured from TS9; Figure 1) of the chamber (7; Figure 1; column 8, lines 17-27) wall Tw, and produce a corresponding temperature (as measured from TS9; Figure 1) signal, and wherein T(to) and T(t*) are the measured temperaues of the chamber (7; Figure 1; column 8, lines 17-27) wall at times to and t*, respectively, as claimed by claim 25

Ashley is not specific in teaching the operation of his valves with respect to the computer logic and processing claimed in claims 1-8, 21-26:

i. A system (Figure 1; column 8, lines 1-65) according to claim 25, wherein the controller (20; Figure 1; column 8, lines 17-67) is configured and arranged so that a controlled amount of mass of the gas (1; Figure 1) can be allowed to flow from the chamber (7; Figure 1; column 8, lines 17-27) as a function time derivative of the temperature (as measured from TS9; Figure 1), as claimed by claim 26

Nawata is discussed below. In particular, Nawata teaches mass flow control based on equations of state ([0130]-[0111]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the operation of Ashley's controller (20; Figure 1; column 8, lines 17-67) as taught by Nawata.

Motivation to optimize the operation of Ashley's controller (20; Figure 1; column 8, lines 17-67) as taught by Nawata is for optimizing the operation of Ashley's apparatus as taught by Ashley (column 8, lines 65-67) and for prevention of line clogging as taught by Nawata ([0038]). Further, it would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

4. Claims 1-10, 21-26, and 30 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nawata, Tokuhide et al. (US 20040244837 A1). Nawata teaches a system (Figure 1) for delivering a desired mass of gas ("from process gas source"; Figure 1), comprising: a chamber (13; Figure 1); a first valve (12; Figure 1) controlling gas ("from process gas source"; Figure 1) flow into the chamber (13; Figure 1); a second valve (17; Figure 1) controlling gas ("from process gas source"; Figure 1) flow out of the chamber (13; Figure 1); a pressure transducer (14; Figure 1) providing measurements of pressure within the chamber (13; Figure 1); an input device (19; Figure 1) for providing a desired mass of gas ("from process gas source"; Figure 1) to be delivered from the system (Figure 1); a controller (19; Figure 1) connected to the valves, the pressure transducer (14; Figure 1) and the input device (19; Figure 1) and programmed to, receive the desired mass

of gas ("from process gas source"; Figure 1) through the input device (19; Figure 1), close the second valve (17; Figure 1); open the first valve (12; Figure 1); receive chamber (13; Figure 1) pressure measurements from the pressure transducer (14; Figure 1); close the first valve when pressure within the chamber (13; Figure 1) reaches a predetermined level; wait a predetermined waiting period to allow the gas ("from process gas source"; Figure 1) inside the chamber (13; Figure 1) to approach a state of equilibrium; open the second valve at time=t_0; and close the second valve at time=t* when the mass of gas ("from process gas source"; Figure 1) discharged equals the desired mass – claim 1

Nawata further teaches:

xiii. A system (Figure 1) according to claim 1, wherein the mass discharged .DELTA.m is equal to, .DELTA.m=m(t_0)-m(t*)=V/R[(P(t_0)/T(t_0))-(P(t*)/T(- t*))] (5) wherein m(t_0) is the mass of the gas ("from process gas source"; Figure 1) in the delivery chamber (13; Figure 1) at time=t_0, m(t*) is the mass of the gas ("from process gas source"; Figure 1) in the delivery chamber (13; Figure 1) at time=t*, V is the volume of the delivery chamber (13; Figure 1), R is equal to the universal gas ("from process gas source"; Figure 1) constant (8.3145 J/mol K), P(t_0) is the pressure in the chamber (13; Figure 1) at time=t_0, P(t*) is the pressure in the chamber (13; Figure 1) at time=t*, T(t_0) is the temperature in the chamber (13; Figure 1) at time=t_0, T(t*) is the temperature in the chamber (13; Figure 1) at time=t*, as claimed by claim 2

xiv. A system (Figure 1) according to claim 2, further comprising a temperature probe (15; Figure 1) secured to the delivery chamber (13; Figure 1) and connected to the controller

(19; Figure 1), wherein the temperature probe (15; Figure 1) directly provides $T(t_0)$ and $T(t^*)$ to the controller (19; Figure 1), as claimed by claim 3

xv. A system (Figure 1) according to claim 3, further comprising a temperature probe (15; Figure 1) secured to the delivery chamber (13; Figure 1) and connected to the controller (19; Figure 1) and wherein $T(t_0)$ and $T(t^*)$ are calculated using: dT/dt=(.rho..sub.STP/.rho.V)Q.sub.out(.gamma.-1)T+(Nu.kappa./l)(A.sub.w/V-sub.v.rho.) .sub.w-T) (3) where .rho..sub.STP is the gas ("from process gas source"; Figure 1) density under standard temperature and pressure (STP) conditions, .rho. equals the density of the gas ("from process gas source"; Figure 1), V is the volume of the chamber (13; Figure 1), Q.sub.out is the gas ("from process gas source"; Figure 1) flow out of the delivery chamber (13; Figure 1), T equals absolute temperature, .gamma. is the ratio of specific heats, Nu is Nusslets number, .kappa. is the thermal conductivity of the gas ("from process gas source"; Figure 1), C.sub.v is the specific heat of the gas ("from process gas source"; Figure 1) under constant volume, l is the characteristic length of the delivery chamber (13; Figure 1), and T.sub.w is the temperature of the wall of the chamber (13; Figure 1) as provided by the temperature probe (15; Figure 1), as claimed by claim 4

xvi. A system (Figure 1) according to claim 4, wherein the gas ("from process gas source"; Figure 1) flow out of the delivery chamber (13; Figure 1) is calculated using: Q.sub.out=-(V/.rho..sub.STP)[(1/RT)(d.rho./d- t)-(P/RT.sup.2)(dT/dt)] (4), as claimed by claim 5

xvii. A system (Figure 1) according to claim 1, wherein the predetermined level of pressure is provided through the input device (19; Figure 1), as claimed by claim 6

xviii. A system (Figure 1) according to claim 1, wherein the predetermined waiting period is provided through the input device (19; Figure 1), as claimed by claim 7

xix. A system (Figure 1) according to claim 1, further comprising an output device (19; Figure 1) connected to the controller (19; Figure 1) and the controller (19; Figure 1) is programmed to provide the mass of gas ("from process gas source"; Figure 1) discharged to the output device (19; Figure 1), as claimed by claim 8

xx. a system (Figure 1) according to claim 1, wherein the chamber is a delivery chamber further comprising a process chamber ("tovacuum vessel"; Figure 1) connected to the delivery chamber (13; Figure 1) through the second valve (17; Figure 1), as claimed by claim 9

xxi. A system (Figure 1) according to claim 1, wherein the pressure transducer (14; Figure 1) has a response time of about 1 to 5 milliseconds ([0114]), as claimed by claim 10

xxii. A system (Figure 1) for delivering a desired quantity of mass of gas ("from process gas source"; Figure 1), comprising: a chamber (13; Figure 1) including an inlet (inlet to chamber 13; Figure 1) and outlet (outlet from chamber 13; Figure 1); an inlet valve (12; Figure 1), connected to the inlet (inlet to chamber 13; Figure 1), configured and arranged so as to control the flow of gas ("from process gas source"; Figure 1) into the chamber (13; Figure 1) through the inlet (inlet to chamber 13; Figure 1); an outlet valve (17; Figure 1), connected to the outlet (outlet from chamber 13; Figure 1), configured and arranged so as to control the flow of gas ("from process gas source"; Figure 1) from the chamber (13; Figure 1) through the outlet (outlet from chamber 13; Figure 1); and a controller (19; Figure 1) configured and arranged to control the inlet and outlet valves so

that (a) gas ("from process gas source"; Figure 1) can flow into the chamber (13; Figure 1) until the pressure (as measured from 14; Figure 1) within the chamber (13; Figure 1) reaches a predetermined level, b) the pressure (as measured from 14; Figure 1) of gas ("from process gas source"; Figure 1) within the chamber (13; Figure 1) can reach a state of equilibrilum, and c) a controlled amount of mass of the gas ("from process gas source"; Figure 1) can then be measured and allowed to flow from the chamber (13; Figure 1) as a function of a setpoint ("predetermined value"; [0013]) corresponding to a desired mass , and the temperature (as measured from 15; Figure 1) and pressure (as measured from 14; Figure 1) in the chamber (13; Figure 1), as claimed by claim 21

xxiii. A system (Figure 1) according to claim 21, further including a pressure sensor (14; Figure 1) constructed and arranged so as to provide a pressure (as measured from 14; Figure 1) measurement signal (via 19) to the controller (19; Figure 1) as a function of the pressure (as measured from 14; Figure 1) within the chamber (13; Figure 1), and a temperature sensor ("TS9"; Figure 1; column 8, lines 17-27) constructed and arranged so as to provide a temperature (as measured from 15; Figure 1) measurement signal (via 19) to the controller (19; Figure 1) as a function of the temperature (as measured from 15; Figure 1) within the chamber (13; Figure 1), as claimed by claim 22

xxiv. A system (Figure 1) according to claim 21, wherein the amount of mass of gas ("from process gas source"; Figure 1) flowing from the chamber (13; Figure 1), delta m at time t*, is determined by the controller (19; Figure 1) as follows: {}, wherein m(t*) is the mass of the gas ("from process gas source"; Figure 1) in the chamber (13; Figure 1) at time = to when the gas ("from process gas source"; Figure 1) within the chamber (13;

Figure 1) is at a state of equillibrium, m(t*) is the mass of the gas ("from process gas source"; Figure 1) in the chamber (13; Figure 1) at time = t*, V is the volume of the chamber (13; Figure 1), R is equal to the ideal gas ("from process gas source"; Figure 1) constant, P(to) is the pressure (as measured from 14; Figure 1) in the chamber (13; Figure 1) at time = to, P(t*) is the pressure (as measured from 14; Figure 1) in the chamber (13; Figure 1) at time = t*, T(to) is the temperature (as measured from 15; Figure 1) in the chamber (13; Figure 1) at time = to, T(t*) is the temperature (as measured from 15; Figure 1) in the chamber (13; Figure 1) at time t*, as claimed by claim 23

xxv. A system (Figure 1) according to claim 21, wherein the controller (19; Figure 1) is further configured and arranged to control operation of the inlet valve (12; Figure 1) by control commands ([0013]), as claimed by claim 24

xxvi. A system (Figure 1) according to claim 21, wherein the chamber (13; Figure 1) includes a chamber (13; Figure 1) wall, and further comprising a temperature sensor ("TS9"; Figure 1; column 8, lines 17-27) configured and arranged to sense a temperature (as measured from 15; Figure 1) of the chamber (13; Figure 1) wall Tw, and produce a corresponding temperature (as measured from 15; Figure 1) signal, and wherein T(to) and T(t*) are the measured temperaues of the chamber (13; Figure 1) wall at times to and t*, respectively, as claimed by claim 25

xxvii. A system (Figure 1) according to claim 21, wherein the chamber (13; Figure 1) is a delivery chamber (13; Figure 1), and further comprising a process chamber ("To Vacuum Vessel"; Figure 1) connected to the delivery chamber (13; Figure 1) through the outlet valve (17; Figure 1), as claimed by claim 30

Nawata is not specific in teaching the operation of his valves with respect to the computer logic and processing claimed in claims 1-8, and 21-29:

i. A system (Figure 1) according to claim 25, wherein the first valve (12; Figure 1) is configured and arranged so that a controlled amount of mass of the gas ("from process gas source"; Figure 1) can be allowed to flow from the chamber (13; Figure 1) as a function time derivative of the temperature (as measured from 15; Figure 1) {}, as claimed by claim 26

In the event that Nawata is not deemed to anticipate Applicant's claimed invention, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the operation of the claimed apparatus.

Motivation to optimize the operation of the claimed apparatus is for prevention of line clogging as taught by Nawata ([0038]). Further, it would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

5. Claims 11, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nawata, Tokuhide et al. (US 20040244837 A1) in view of Ohmi; Tadahiro et al. (US 6193212 B1). Nawata is discussed above. Nawata does not teach that his second valve (17; Figure 1) has a response time of about 1 to 5 milliseconds. Ohmi teaches a fluid delivery valve (Figure 1) with a response time of "a few milliseconds" (column 3; lines 24-33; Table 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Nawata's second valve (17; Figure 1) with Ohmi's fluid delivery valve.

Motivation to replace Nawata's second valve (17; Figure 1) with Ohmi's fluid delivery valve is for preventing counter flow as taught by Nawata (column 2; lines 48-61).

Response to Arguments

6. Applicant's arguments filed February 19, 2008 have been fully considered but they are not persuasive.

7. Applicant states:

"

Ashley in fact does not teach that its controller calculates actual mass flow emitted from the system. Ashley describes the operation of its disclosed MFC as follows.

"

8. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As noted previously, the Examiner specifically stated that Ashley is not specific in teaching the operation of his valves with respect to the computer logic and processing claimed in claims 1-8, 21-26.

Applicant states:

"

For the Nawata system and method, measurements are made only after a particular gas flow delivery process ('or pulse shot) has been completed. See Nawata, paragraph [0061]. See, also, Nawata, Abstract

"

And..

"

Importantly, if the mass in the gas flow delivered by the Nawata system is insufficient for required purposes, the only recourse is to correct the error by a subsequent delivery process (pulse shot) as the Nawata system does not measure actual mass delivered by the system when the outlet valve is in an open condition.

"

9. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The Examiner's rejection specifically stated: "It … to optimize the operation of Ashley's controller (20; Figure 1; column 8, lines 17-67) as taught by Nawata.". The proposed *combination* thus meets the claimed invention.

10. Applicant takes issue with the Examiner's assetion that Ashley teaches "and close the second valve (13/14; Figure 1; column 8, lines 1-16) at time=t* when the calculated value of

total mass delivered equals the desired mass flow setpoint (column 9; lines 1-20)" as claimed by claim 1. The Examiner remains convinced that Ashley's description in column 9, lines 1-20 indeed supports such claimed operation. Here, Applicant's "calculated total mass delivered" is the mass analog to Ashley's pressure set point of 200mT = $nRT/V_{reactor}$ = (calculated total mass delivered/gram molecular weight)RT, calculated total mass delivered = 200mT*GMW*RT. Thus Ashley's setpoint of 200mT is inherently a "calculated value of total mass delivered". A similar reasoning is set forth in response to arguments based on Nawata, Tokuhide et al. (US 20040244837 A1).

11. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

12. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as stated in each of the Examiner's proposed combinations, the prior art

structure and the structure of the claimed invention are indisitinguishable in structure and nearly indistinguuishable in function. The Exaniner believes that artisens of ordinary skill in the art with knowledge of the ideal gas law from high school physics can indeed arrive at the claimed controller operation as argued by the Examiner above.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1792 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

/Rudy Zervigon/

Primary Examiner, Art Unit 1792

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/822,358	SHAJII ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1792	